Can Technologists Contribute to the Solution of Social Problems ?

by Charles Schwartz

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What are the great problems faced by human society? They are war, poverty, injustice; and our concern should lie with the many societies of people throughout the world who suffer these evils. Here in America, although we live an easier life than most others, we still have many societal problems: pollution, crime, employment, health, housing, education, transportation, etc., not to mention the more subtle evils of racism and other forms of social injustice.

Scientists and engineers have recently been turning more of their attention to these societal problems. One motivation is that it has been recognized that the inventions of modern science and technology have in many instances been instrumental in the cancerous growth of these societal problems and we, in these technical professions, would like to be able to contribute to the *solutions* rather than to accentuate the *problems.* Indeed, many people outside of our professions have labeled science and technology as the devils responsible for society's problems and so we would like to defend ourselves from such sweeping accusations by at least trying to work for social betterment. Most commonly we are apt to say, "Science is neither good nor bad, it is the uses to which science and technology are put that matter; and if our current problems are attributed to an accumulation of 'misuses' of technology, then our goal should be to seek more 'good' uses to replace the 'bad' uses."

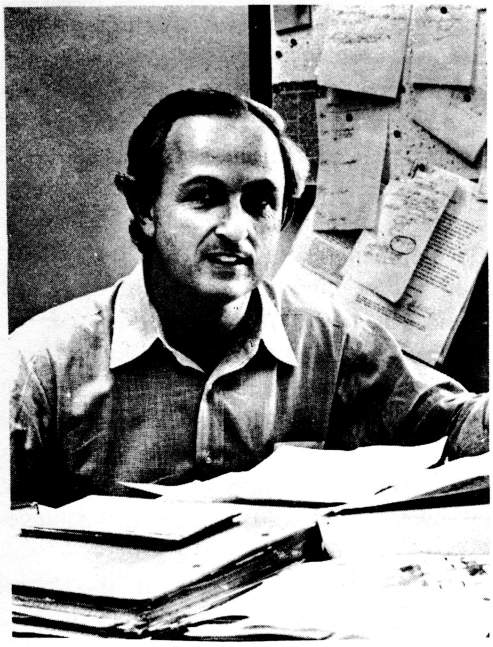
I join in rejecting the extreme view that science and technology should be totally abolished because of their intrinsic evil. However, if we wish to pursue the goal of redirecting science and technology, of making it serve more humane and less destructive ends, then I think we must start out with a serious analysis of the problems in the broadest context. Having acknowledged that there have indeed been gross misuses of technology we must ask, What are the causes for this? Is it simply a matter of accident or carelessness; or can one understand these happenings as the natural consequences of some systematic enveloping forces?

In order to study the relation of technology to societal problems, and to learn the causes of these problems, we should not imagine these problems as isolated phenomena existing in a vacuum. We need to look at them in the context of the whole of American society; that means we must look at these problems within the framework of the economic and political forces that govern this country. And let us not be naive, saying simply that America is a democracy, the freest and richest country in the world. Let us look at how the riches and the power in this country are distributed.

America is the strongest economic and military force in the world today; but control over this might is not exercised uniformly, or even democratically, by the citizens of this country. The enormous inequality in the distribution of wealth and power in America is usually summarized by the statement: at most one percent of the people own or control essentially all of the major corporations. This means that a very small set of people exercise control over the access to natural resources, the production and marketing of goods, the uses of labor, the financial reserves; and through these powers they will also exert a dominating influence on all our political institutions. The appropriate term to use in designating this set of people is, "the ruling class," and there is no need for us to be embarrassed about using this term. To be sure, the American ruling class of today is not made up in the same way as other ruling classes, in other countries and at other times. The main features of this ruling class are: 1. Not only is it a very small set of people controlling enormous power, but this concentration and centralization of power has actually been increasing over the past few decades; 2. The membership of the ruling class is self-selecting (one may be lucky enough to be born into this class or, alternatively, lucky enough to succeed in the Horatio Alger tradition), this means that the members are accountable to nobody but themselves; 3. They hold a set of values and pursue a set of interests which are distinctly difkerent from those of the masses of people (their goals are to earn profits, accumulate capital, and then extend the domain of their control in both economic and political terms); 4. As regards the subject of "societal problems" which we want to consider here, the members of the ruling class are generally well insulated by their wealth so that these problems really do not concern them.

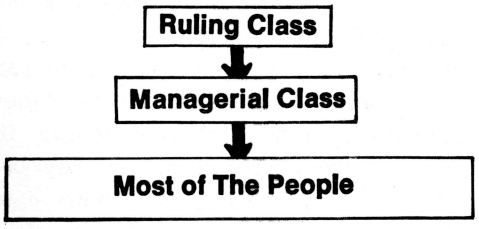
War, poverty, the exploitation of human and natural resources—these things happen basically because it serves the interests of the ruling class to allow, or perhaps even to cause, them to happen. Domestic ills—decrepit inner cities, polluted air, racial and economic discrimination, inadequate housing, education, transportation, safety and health—may be given serious attention if public outrage becomes sufficiently high, and then only if the major corporations can see a profit in it for them.

Modern industrial society is a very complex system; much of this complexity is the direct result of technological developments. In order for the ruling class to be able to achieve its continuing control over the workings of this complex system it has need of a managerial class. This managerial class (which would include most engineers, along with people trained in a variety of other specialzed skills) would have and exercise the technical knowhow to keep the system functioning. Of course the ruling class would keep a tight rein on these managers, defining their missions and enforcing their obedience to policies handed down from above, but it would also encourage the managers to feel superior to and removed from the



(Photo by David Flores)
Charles Schwartz—Professor of Physics, U.C. Berkeley.

masses of people who are to be manipulated by the system. The structure I have described can be represented by a simple diagram, as follows.



Of course, any such diagram is a simplification but I believe this picture holds most of the truth and ignores only lesser details. The heavy arrows indicate the flow of authority and control and it is this dynamical part of the picture which is more important than the mere static structure which is implied by just enumerating the different classes. One might want to add some other flow lines to this diagram to indicate the possibility of upward mobility (this is what the American dream presents): that anyone of the people can go to college and end up as one of the managerial class and occasionally some very lucky individual may rise into the ruling class. However, while such upward mobility may benefit a few individuals, most of the people, and indeed the whole unbalanced structure of the system, will not receive any improvement. This is because in order to advance into a "higher" class any individual will have to adopt the self-serving values of that higher class and to turn his back on the needs of the larger numbers of people whom he leaves behind in the "lower" class.

The major complaint against this diagram is that it ignores the democratic process and the machinery of the law. In principle, each citizen votes with equal weight to have elected representatives who will enact laws and these laws can limit the excesses of corporate power. Thus, if the democratic ideal were truly realized, then the largest arrow in our diagram should be one showing the flow of authority and control up from the people to the rulers. However, the reality is far from this ideal. The large corporations are very effective at lobbying with elected representatives and at financing candidates sympathetic to their interests. The much praised "two-party system" is really only a one-party system as regards the fundamental support of the capitalist system, that is, maintaining the basic economic hegemony of the present ruling class. Classic examples of the government's subservience to large corporate interests are: the federal regulatory agencies which have turned away from protecting the citizen toward protecting the corporations; tax incentives and loopholes of many kinds; outright gifts of federal monies to private industries, such as the Lockheed loan, and the whole autonomous Defense Department with its enormous budget for friendly corporations.

Accepting the above picture as being basically correct in outlining the structure of our political and economic system, we can now turn to the original question: What is the place and the function of the scientist and the engineer? As long as we, technologists, accept our position in the managerial class and our role as servant to the ruling class, then we will not even have a chance of helping the people—society as a whole—to solve its problems. More likely, the direction of the manager-technicians will be toward helping the corporate rulers to solve *their* problems. That will mean, concretely, providing the kinds of technology which will lead to a greater concentration of power and the exercise of even greater manipulation and control by the ruling few over everyone else. This is the direction in which we have been moving and it would be well to identify the eventual outcome of such a progression: a system in which *all* economic and political power is effectively held by a central and autonomous group. Such a system is called fascism, and it is important for us to recognize today those trends in America which are headed that way. Frankly, many people in America today would welcome fascism, because it does provide a kind of security for its adherents (a security, however, which means the end of democracy). Also, quite frankly, many professional technologists would be happy to play a role in implementing this trend toward fascism for it would appear to take care of the "messy" problems of all those people out there, while these elite ones would be living very comfortably.

I think that the university, as an institution, may not be very much help either, in trying to oppose this growing centralization of power by the corporate elite. To a large extent the universities were founded by and are funded by large corporations and by the government, which wants to protect and advance those corporate interests. At best, we professors usually give our students the theory that science and engineering are "neutral" as regards any social or moral value but we refrain from discussing the realities of the economic and political context in which this work is to be carried out. For example, consider the use of "systems analysis" which is a popular engineering approach to studying societal problems. As long as the basic economic and political forces of our society are not treated as variables, but rather are assumed as implicit constraints on the kinds of solutions allowed, then one must expect that the output will be biased toward preserving or strengthening the existing system. Of course, some number of leading professors are not even "neutral" but are active in their professional practice to help the corporations and their related government agencies to advance their special interests. This contribution takes place through private consulting services of professors, in addition to the more open research programs sponsored

on campuses by outside money.

The misuse of technology and the many other socially harmful effects caused by the big capitalists are not confined to this country; indeed their most abhorrent exploits are conducted abroad. U.S. corporations have grown into multinational conglomerates which conduct their business for maximized profits and extended control on a worldwide map. When called upon, the U.S. military establishment stands ready to protect these economic investments, with little regard for the sovereignty of the people in the weaker nations being exploited. The proper word used to describe this congruence of economic and military venturing is "imperialism." Since some will be tempted to dismiss this as just another piece of radical rhetoric, let me quote from a couple of very establishment sources to confirm this idea.

1. Executive Vice,President, International Division, of the Bank of America (Mr. C. M. van Vlierden), as reported in the San Francisco Chronicle business pages, January 17, 1973:

> "The time has long gone when any nation can run its monetary policy only on its domestic principles and problems. Bank of America is fully committed to building a system of total financial services around the globe . . . . (Bank of America overseas resources aggregate more than $10 billion.)"
>
> "When war winds down in Vietnam . . . . the Pacific Basin will become the most rapidly developing part of the world."
>
> "There is developing a concerted effort to curb activities of the multinational companies (by U.S. labor and some underdeveloped countries), but the multinationals must be recognized as great agents for dissemination of technology and powerful agents toward integration."

In that last phrase he is, of course, referring to American technology, designed to meet the needs of American corporations and to bring the underdeveloped country's own industry under the centralized control ("integration") of the multinational capitalists.

2. Lieutenant General Richard G. Stilwell, commander of the U.S. Sixth Army, speaking to a Rotary Club luncheon, as reported in the S. F. Chronicle, December 13, 1972:

> Speaking, at the Sheraton-Palace hotel he predicted a dramatic shift in the overall world power balance, which could result in "economic warfare." . . . "Disengagement from Southeast Asia by no means means disengagement from Asia . . . we must continue to make strategic investments. We've reached this point because we have blue chips to play. We need as much strength to end the conflict as we needed to fight it."
>
> Stilwell warned against new conflicts over raw resources, such as crude oil and natural gas, and affirmed the nation's commitment to protecting America's interests in areas where these "strategic materials" are plentiful. "The U.S. Army is an integral part of the national fabric. We will take whatever resources are provided by Congress and shape them into a military investment of which you all can be proud."

If the discussion thus far seems to be very theoretical, perhaps even somewhat vague, we can look at the concrete example of the war in Vietnam. Here we have seen the interplay of American political, economic and military interests at work in their most naked and aggressive form. And modern technology has played a very large part in creating a new and more anti-human kind of warfare, where sophisticated machines and and devices have replaced the America soldier as the fighting element, and the people throughout Indochina must suffer the human pain so thoroughly dispensed by this automatic destructive force. (The story of the "Automated Air War" is most perceptively told in a prepared audio-visual show available from NARMIC, a project of the American Friends Service Committee, 160 N. 15th Street, Philadelphia, Pa. 19102.) Automated warfare is an extensive system of sensors, communications relays and computers which detect possible targets (people, vehicles, or anything warm or moving) and automatically directs aircraft to deliver whatever type of ordnance seems needed for destruction of the target. This system was conceived by a group of leading academic scientists, consulting for the Pentagon in 1966; it has been developed and refined through the skill of many fine engineers in numerous corporations working under continuing contracts with the military; and it is a subject of intensive development for a variety of future uses both by our military abroad and by our police at home. With the push of the military, behind the technological capabilities of American industry, and given the lands of Indochina as an experimental laboratory, we have witnessed in this development of automated warfare the biggest step forward toward the achievement of the world of 1984.

To stop my discourse at this point might leave too many readers with a feeling of hopeless despair. I believe that the trend toward more and more destructive and anti-human uses of technology can be stopped, but only if enough people make the choice to work actively against the system which has been responsible for this evil. I also know that it is very difficult for an individual engineer in a large company to express his dissent against that company's policies, and more difficult still to try to organize one's fellow employees to seek some collective means of exerting a more humanizing influence from within the belly of the corporate whale. My best advice to the technologist who cares about people is to actively involve yourself with the most progressive and anti-establishment groups you can find in your own community. As far as issues particularly related to science and engineering, there are three publications you should know about which will help you keep in touch with the small movements already underway within the technological fields: *"Science for the People,"* bimonthly publication of SESPA, Scientists and Engineers for Social and Political Action, 9 Walden Street, Jamaica Plain, Mass. 02130. *"Interrupt,"* newsletter of Computer People for Peace, 291 Sterling Place, Brooklyn, New York 11238. *"Spark,"* semi-annual publication of The Committee for Social Responsibility in Engineering, 475 Riverside Drive, New York, N.Y. 10027.